FINAL REMEDIAL ACTION REPORT
WESTERN PACIFIC RAILROAD
SUPERFUND SITE
OROVILLE, CALIFORNIA

Project No.: 41-00173202.00

Prepared for:
Union Pacific Railroad Company
49 Stevenson Street, 15th Floor
San Francisco, California 94105

Prepared by:
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June 2001

URS

June 7, 2001

United States Environmental Protection Agency
Region IX
75 Hawthorn Street, SFD-7-1
San Francisco, CA 94105

Attn: Holly Hadlock
Remedial Project Manager

Subject: **Final Remedial Action Report**
Western Pacific Railroad Superfund Site
Oroville, California
URS Project No. 41-00173202.00

Dear Ms. Hadlock:

Union Pacific Railroad (UPRR) has requested that URS Corporation transmit the enclosed Final Remedial Action Report for the above-referenced site. If you have any questions regarding this report, please call us at (916) 679-2000.

Sincerely,

URS

Verne W. Brown
Project Manager

Joseph Turner, R.G., C.H.
Program Manager

Enclosure

cc: Mr. Mike Grant – Union Pacific Railroad Company
Mr. Phillip Woodward – California RWQCB

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List of Abbreviations

AOC	Administrative Order of Consent
B(a)P	benzo(a)pyrene
DCA	dichloroethane
DCE	dichloroethene
DTSC	California Department of Toxic Substances Control [California Environmental Protection Agency]
EW	extraction well
FS	Feasibility Study
GMP	Groundwater-Monitoring Plan
MCL	Maximum Contaminant Level [drinking water]
mg/Kg	milligrams per kilogram
mg/L	milligrams per liter
MW	monitoring well
NPL	US EPA National Priorities List or Superfund List
PAH	polycyclic aromatic hydrocarbon [aka: polynuclear aromatic hydrocarbon]
QA/QC	Quality Assurance/Quality Control
RA	Removal Action
RAO	Remedial Action Objectives
RI	Remedial Investigation
ROD	Record of Decision [US EPA]
RWQCB	California Regional Water Quality Control Board, Central Valley Region [California Environmental Protection Agency]
SAP	Sampling and Analysis Plan
SOW	Scope of Work
SRC	Solano Railcar Company
SVE	soil vapor extraction
TCA	trichloroethane
TCE	trichloroethene
UPRR	Union Pacific Railroad Company
US EPA	United States Environmental Protection Agency
UST	Underground storage tank
VOC	volatile organic compound
WPRR	Western Pacific Railroad Company [UPRR predecessor at site]

1.0 INTRODUCTION

The purpose of this Final Remedial Action (RA) Report is to present descriptions of remedial activities undertaken at the Western Pacific Railroad Superfund Site in Oroville, California (site). These activities were conducted in accordance with the Record of Decision (ROD) (United States Environmental Protection Agency [US EPA], 1997), and Administrative Order on Consent for Removal Action (US EPA, 1993).

The format of this report generally follows guidance provided in US EPA Office of Emergency and Remedial Response Directive 9320.09A, *Close Out Procedures for National Priorities List Sites* (US EPA, 2000a). This report consists of ten sections including this introduction. Section 2.0 presents the operable unit background, Section 3.0 presents the remediation activities, and Section 4.0 presents a chronology of events. Section 5.0 evaluates performance standards and construction quality control. Section 6.0 reports the results of various inspections by US EPA personnel. Section 7.0 describes general activities for post-remediation operations and maintenance. Section 8.0 provides a summary of the clean-up costs. Section 9.0 provides contact information, and Section 10.0 provides a list of references cited.

1.1 SETTING AND OPERATIONAL HISTORY

The site is located at the southern end of the City of Oroville, in Butte County, California as shown in Figure 1. The site covers approximately 113 acres between Baggett-Marysville Road on the east and 5th Avenue on the west (Figure 2). The Union Pacific Railroad (UPRR) currently operates a railroad-switching yard and mainline through the site.

The site was an active fueling and maintenance yard from the 1880s until 1970. Activities included locomotive fueling, routine maintenance, and railcar repair, such as welding, painting, fabricating and machining of railcars. In 1970, Western Pacific Railroad (WPRR) ceased its maintenance and repair activities and leased a portion of the Fueling Area containing the roundhouse and turntable to Solano Railcar Company (SRC). SRC's operations included sandblasting, painting, welding, and machining railcars up until approximately 1991. The fueling tracks and drip pans in the Fueling Area were used until 1991, at which time UPRR dismantled the remaining structures in the Fueling Area. The Fueling Area is currently inactive and surrounded by a fence. UPRR continues to run trains on the main railroad line, and the portion of the property west of the site is used as a switching yard.

1.2 REGULATORY HISTORY

The California Regional Water Quality Control Board, Central Valley Region (RWQCB) initially investigated the site in the 1980s. In 1989, the RWQCB issued an order to UPRR to investigate an on-site waste pond and groundwater beneath the site. In 1989, the waste pond was excavated and backfilled with clean fill, groundwater monitoring wells were installed at the site, and a leaking underground storage tank (UST) at the southeast edge of the Fueling Area was discovered and removed.

On August 30, 1990, the site was added to the National Priority List (NPL or Superfund List). A remedial investigation was conducted as required by the Administrative Order of Consent (AOC)

for Removal Action (US EPA, 1993). The remedial investigation (RI) activities included surface and subsurface-soil testing and surface-water pathway investigation. The investigation identified polycyclic aromatic hydrocarbon- (PAH) contaminated soils in the area adjacent to the waste-oil separator. The primary impact to groundwater consisted of volatile organic compounds (VOC), including 1,1-dichloroethene (1,1-DCE), with 1,1,1-trichloroethane (1,1,1-TCA), 1,1-dichloroethane (1,1-DCA), and trichloroethene (TCE). The ROD (US EPA, 1997) specifies that the final aquifer Remedial Action Objectives (RAOs) are the federal and state Maximum Contaminant Levels (MCLs) for 1,1-DCE, 1,1,1-TCA, 1,1-DCA and TCE.

In 1994, pursuant to the US EPA's AOC for Removal Action (US EPA, 1993), UPRR implemented groundwater extraction and treatment to remediate groundwater impacts in the Fueling Area. In 1997, a second extraction well and a soil vapor extraction (SVE) unit were installed near the source area to optimize the pumping and treatment system.

Approximately 2,500 cubic yards of impacted soils were removed in 1998. Groundwater clean-up standards were attained in February 2000 (Dames & Moore, 2000b) and, after 9 additional quarterly groundwater-monitoring rounds, the US EPA declared the work complete on March 13, 2001 (US EPA letter to URS Corporation).

2.0 OPERABLE UNIT BACKGROUND

This section summarizes the requirements specified in the ROD (US EPA, 1997) for the site. More detailed discussions are presented in the Soil Remedial Action Report (Dames & Moore, 1999), and the Winter Quarter – 2000 Groundwater and Treatment System Monitoring Report (Dames & Moore, 2000b). The ROD set forth the following requirements for the immediate clean-up and long-term protection of human health and environment (US EPA, 1997). The major components of the selected remedy are:

- Excavation of the top one-foot of soil in the most contaminated one acre, and reducing the residual mean soil concentration for benzo(a)pyrene (B(a)P) to 0.41 milligrams per kilogram (mg/Kg) or less;

- Off-site disposal of contaminated soil in compliance with the Off-site Rule;

- Groundwater clean-up using extraction and treatment through air stripping. The final aquifer RAOs are federal or more stringent State MCLs for 1-1-DCE, 1,1,1-TCA, 1,1-DCA and TCE; and

- Institutional controls including, but not limited to, restricting the future use of the site to industrial use only.

3.0 REMEDIATION ACTIVITIES

The following sections provide a summary of the activities taken to implement the RAs as specified in the ROD. These activities are presented in greater detail in the Soil Remedial Action Report (Dames & Moore, 1999), and the Winter Quarter – 2000 Groundwater and Treatment System Monitoring Report (Dames & Moore, 2000b).

3.1 SOIL REMEDIATION

As stated in the ROD for the site, the soil RA included the excavation and off-site disposal of approximately 1,600 cubic yards of surfacial soil impacted with PAHs. The remediation goal was to achieve an average residual shallow soil B(a)P equivalent concentration in the Fueling Area of 0.41 mg/Kg or less (US EPA, 1997). The soil RA was designed and implemented in accordance with the Final Soil Remedial Action Work Plan (Dames & Moore 1998) and the requirements of the Administrative Order for Remedial Acton issued by the US EPA on June 17, 1998 (US EPA, 1998b).

Initial waste characterization sampling was conducted on June 4 through July 23, 1998. Soil remediation construction activities commenced July 23, 1998, and all waste was excavated and loaded into railcars for transport by July 28, 1998.

The final amount of soils removed was approximately 2,500 cubic yards. The US EPA conducted a final inspection of the soil removal RA on December 10, 1998, and determined that all required remedial activities were completed. The attainment of clean-up standards is presented in the Soil Remedial Action Report (Dames & Moore, 1999).

3.2 GROUNDWATER REMEDIATION

On September 19, 1994, a groundwater-treatment system was installed in accordance with the August 27, 1993 RA. This work is documented in the Removal Action Report (Dames & Moore, 1995c). The system initially consisted of an extraction well, air stripper and injection well. The system was modified during the Winter Quarter 1997 with the addition of a dual-phase extraction well near the source area (EW-2) that remediated both impacted groundwater and soil gasses. The system was operated continuously to contain and remediate impacted groundwater. By Fall Quarter 1997, VOC concentrations in all groundwater samples were reported to be below MCLs. The Fall Quarter 1999 marked the eighth consecutive sampling quarter that VOCs reported in groundwater samples were in compliance with the RAOs (Dames & Moore, 2000a). These results met US EPA's groundwater-treatment system closure criteria for the site (US EPA, 1998a). US EPA also authorized the cessation of the Groundwater Monitoring Plan (GMP), pending analysis of confirmatory samples collected from the site in May and July 2000 (US EPA, 2000b). The attainment of groundwater RAOs is presented in the Winter Quarter – 2000 Groundwater and Treatment System Monitoring Report (Dames & Moore, 2000b). US EPA declared the groundwater RA cleanup complete on March 13, 2001 (US EPA, 2001).

3.3 INSTITUTIONAL CONTROLS

The US EPA, California Department of Toxic Substances Control (DTSC), and UPRR developed a Covenant to Restrict Use of Property (Covenant) as directed in the ROD (US EPA, 1997). The Covenant defines measures to further protect off-site residents, trespassers and on-site workers from residual soil and groundwater impacts at the site. These measures consist of the following:

- All owners and/or lessees of the property are bound to comply with the terms of the Covenant.
- Upon sale of any part of the property, the prospective buyer must be notified of the potential presence of toxic compounds on or beneath the property.
- The restrictions of the Covenant are to be incorporated into any deed or lease.
- UPRR must provide the DTSC with notice of the sale of any portion of the property.
- Use of the property for residence, hospital, school, or day care center purposes is prohibited.
- No excavated soil may be removed from the property without express approval by the DTSC.
- No groundwater may be extracted from within the property boundary, with the exception of extraction for treatment purposes under the groundwater-removal action.
- The groundwater-removal action extraction and treatment system is to remain functional at all times until the removal action is deemed complete.
- UPRR and any future owners or lessees must provide access to the DTSC, US EPA, and other oversight agencies upon notice.

The US EPA agreed to the property on which the Covenant was binding in December 2000. On January 4, 2001, US EPA conducted a final inspection of the property to be placed under the Covenant, and determined that all appropriate areas were included. The deed restrictions were filed with Butte County, California on March 1, 2001.

Additional institutional controls included the installation of a six-foot high, chain-link fence with three strand barbed wire and warning signs surrounding the Fueling Area portion of the site.

4.0 CHRONOLOGY OF EVENTS

This section provides a tabular summary of the major events for the site and associated dates starting with the ROD signature.

TABLE 1
Event Chronology
WPRR Superfund Site
Oroville California

DATE	EVENT
9/30/97	ROD signed.
Fall Qtr 1997	First Quarter VOCs in all monitoring/extraction wells are below the MCLs.
4/28/98	UPRR, Dames & Moore and US EPA meet to negotiate SOW for soil remedial action.
6/4/98	Final Soil Remedial Action Work Plan submitted to US EPA.
June 1998	Completed pre-excavation waste characterization analysis and additional testing of potential on-site backfill material.
7/23/98	Soil remediation construction activities commenced.
7/28/98	Excavated soils loaded onto railcars and ready for transport.
7/ 29-30 /98	Excavated areas backfilled.
12/10/98	US EPA conducted a final inspection of the Fueling Area RA and determined that all required remedial construction activities were completed.
August 1998	Draft Soil Remedial Action Report submitted to US EPA for review and comment.
September 1998	Supplemental Field Sampling Plan for assessment of residual B(a)P in Fueling Area soils submitted to US EPA.
12/31/98	Because VOC concentrations in all groundwater samples continued to be reported below MCLs, extraction well EW-1 shut down to monitor for any rebounds. Supplemental soil samples were collected within the soils remedial action removal area.
6/29/99	Because VOC concentrations all in groundwater samples continued to be reported below MCLs, extraction well EW-2 is shut down to assess any potential rebounds. The SVE system continued to operate.
9/27/99	Final Soil Remediation Action Report was completed and forwarded to US EPA.
Fall Qtr – 1999	Eighth consecutive quarter where VOCs were reported to be below MCLs in all groundwater samples.
11/11/99	UPRR, US EPA and DTSC agree to the language for the deed restrictions for the site.
November 1999	Because VOC concentrations in all groundwater samples continued to be reported below MCLs, the SVE system shut down to assess whether or not VOC concentrations would rebound in groundwater.
March 2000	The US EPA granted permission to discontinue the GMP based upon results from the Winter Quarter – 2000 sampling which indicated that for the 9th consecutive quarter reported VOC concentrations in all groundwater samples were below MCLs.
4/10/00	Confirmation groundwater samples were collected from MW-89-02 and EW-2.
7/6/00	A second set of confirmation samples were collected from MW-89-02 and EW-2.
July 2000	Preliminary evaluation of UPRR property parcels to be placed under deed restrictions as part of the institutional controls was conducted.
August 2000	The preliminary boundary of the property to be placed under a deed restriction was submitted to US EPA for review. Preliminary surveys conducted in order to gather the necessary information to create a legal description(s) of the parcels.

TABLE 1
Event Chronology
WPRR Superfund Site
Oroville California

DATE	EVENT
10/9/00	The Winter Quarter – 2000 Groundwater Treatment and System Monitoring report was completed and forwarded to the US EPA. The report incorporated the analytical results from the two confirmation sampling events.
November 2000	The draft final legal description and plat of UPRR property to be placed under the deed restriction were forwarded to US EPA, California DTSC and UPRR for review.
1/4/01	The US EPA conducted a final inspection of the site and determined that all properties of concern were identified and included in the deed restriction.
3/1/01	The deed restriction on the property was filed with Butte County.
3/13/01	US EPA states that "the remedial action clean-up for the Western Pacific Railroad Superfund Site in Oroville California is complete and groundwater monitoring has ceased, EPA will no longer require monthly status reports."

5.0 PERFORMANCE STANDARDS AND CONSTRUCTION QUALITY CONTROL

Approximately 2,500 tons of soil were removed from the site. This amount was greater than initially anticipated due to the discovery of impacts remaining after the 12 inches of initial excavation. Statistical analysis of the post-remediation B(a)P data set in accordance with US EPA guidance and standard statistical methods demonstrates that residual B(a)P in shallow soil within the Fueling Area was reduced to 0.363 mg/Kg, less than the RAO of 0.41 mg/Kg on average, thereby reducing excess cancer risks to future Fueling Area workers to less than 1.1 x 10^{-5} (Dames & Moore, 1999).

The groundwater-treatment system treated approximately 127,868,943 gallons of water, removing approximately 2.61 pounds of VOCs during the period 9/29/94 through 2/23/01. The SVE system removed approximately 63.51 pounds of VOCs after only about 21,771 hours of operation (3/12/97 through 11/23/01) (Dames & Moore, 2000).

The quality assurance/quality control (QA/QC) program for the soil removal was implemented in accordance with the Quality Assurance Project Plan (Dames & Moore, 1995b) and the updates incorporated in the Final Soil Remedial Action Work Plan (Dames & Moore, 1998) for analytical data associated with waste characterization, backfill soil characterization, and post-remediation conformation samples.

The QA/QC program for the GMP were implemented in accordance with the Sampling and Analysis Plan (SAP) and the Quality Assurance Project Plan (Dames & Moore, 1995b). The primary control features of the QA/QC GMP program include the collection and analysis of travel blanks, field decontamination blanks, and duplicate water samples and replicate water samples for use by the laboratory as matrix spike and matrix pike duplicate samples.

For both the soil removal and GMP, data validation was performed in compliance with the Quality Assurance Project Plan (Dames & Moore, 1995b). The purpose of data validation is to assess the ability of the analytical data to serve its intended use. A third party company, DataVal of San Rafael, conducted data validation. Details regarding data validation procedures are presented in the Final Soil Remedial Action Report (1999) and the Winter Quarter – 2000 Groundwater and Treatment System Monitoring Report (2000).

6.0 INSPECTIONS AND CERTIFICATIONS

The US EPA inspected the Fueling Area portion of the site on December 10, 1998 and the entire site on January 4, 2001 to evaluate the soil removal RA and the property to be placed under deed restriction. After both inspections, the US EPA determined that all required remedial construction and institutional control activities were completed. The institutional controls for the site are presented in Section 3.0.

7.0 OPERATION & MAINTENANCE ACTIVITIES

The only long-term operation and maintenance issue is the fence around the Fueling Area. Fence maintenance around the site is conducted by UPRR. UPRR will repair or replace components, as necessary. Any future property transactions must comply with the deed restrictions, which are filed with the property grant deed. With the attainment of groundwater RAOs, the groundwater-treatment plant and SVE system are currently shut down and will be dismantled at a later date.

8.0 SUMMARY OF PROJECT COSTS

The ROD provides estimates for the projected costs associated with the soil removal and implementation of institutional controls at the site. Although groundwater extraction and air stripping were the selected remedies for clean up stated in the ROD, no cost analysis is provided. Groundwater cleanup was directed as part of the AOC (US EPA, 1993), which also does not address projected costs. This is a responsible-party funded clean-up project; therefore, the actual expenditures associated with the implementation and execution of the ROD have been estimated where necessary.

Estimated costs associated with the excavation and property restriction alternative presented in the ROD (US EPA, 1997) were as follows:

Capitol Costs	$301,000
Annual O&M Costs	$500
30-Year Present Worth	$307,600

No cost estimates were provided in the ROD for the groundwater clean-up operations and monitoring.

Costs to UPRR associated with the soil removal and property restrictions specified by ROD were approximately $511,000 through May 2001. Total expenditures through May 2001 are approximately $3,778,706.

9.0 CONTACT INFORMATION

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10.0 REFERENCES

Dames & Moore, 1995a, Sampling and Analysis Plan for RI/FS Investigation, Western Pacific Railroad Superfund Site, Oroville, California, April 19.

Dames & Moore, 1995b, Quality Assurance Project Plan, Western Pacific Railroad Superfund Site, Oroville, California, April 19.

Dames & Moore, 1995c, Removal Action Report, Western Pacific Railroad Superfund Site, Oroville, California, December 18.

Dames & Moore, 1998, Final Soil Remedial Action Work Plan, Western Pacific Railroad Superfund Site, Oroville California. June.

Dames & Moore, 1999, Soil Remedial Action Report, Western Pacific Railroad Superfund Site, Oroville, California, September.

Dames & Moore, 2000a, 1999 Annual Groundwater and Treatment System Monitoring Report, Western Pacific Railroad Superfund Site, Oroville, California, February 1.

Dames & Moore, 2000b, Winter Quarter - 2000 Groundwater and Treatment System Monitoring Report, Western Pacific Railroad Superfund Site, Oroville, California, October 9.

US EPA, 1993, Administrative Order on Consent for Removal Action, Western Pacific Railroad, Oroville, California, U.S Environmental Protection Agency, Region 9, San Francisco, August 27.

US EPA, 1997, Record of Decision, Western Pacific Railroad, Oroville, California, U.S. Environmental Protection Agency, Region 9, San Francisco, September 30.

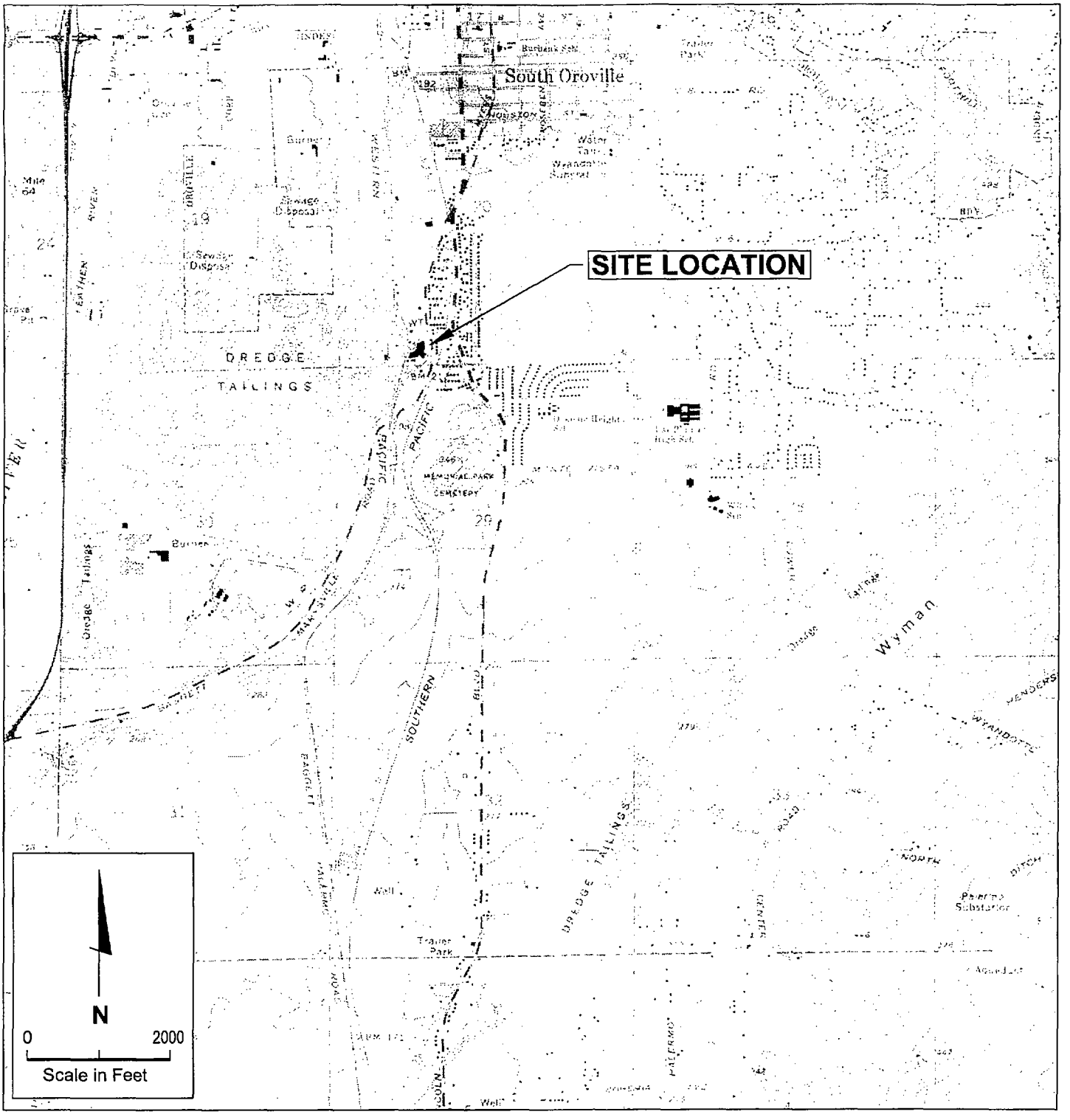
US EPA, 1998a, Letter from Holly Hadlock, EPA PM to UPRR, U.S. Environmental Protection Agency, Region 9, San Francisco, November 6.

US EPA, 1998b, CERCLA Docket No. 98-11. Administrative Order for Remedial Action, Western Pacific Railroad, Oroville, California, U.S. Environmental Protection Agency, Region 9, San Francisco, June 17 (Statement of Work appended).

US EPA, 2000a, Close Out Procedures for National Priorities List Sites, OWSER Directive 9320.0-09A-P, EPA 540-R-98-016, January

US EPA, 2000b, Letter from Holly Hadlock, EPA PM to UPRR, U.S. Environmental Protection Agency, Region 9, San Francisco, April 10.

US EPA, 2001, Letter from Holly Hadlock, EPA PM to URS Corporation, U.S. Environmental Protection Agency, Region 9, San Francisco, March 13.



REFERENCE: USGS 7.5 Quadrangle; Palermo, Ca, 1970

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SITE VICINITY MAP

Final Removal Action Report
Western Pacific Railroad Superfund Site
Oroville, California

UnionPacific\Oroville lea May 16, 2001 010511SVM.DWG

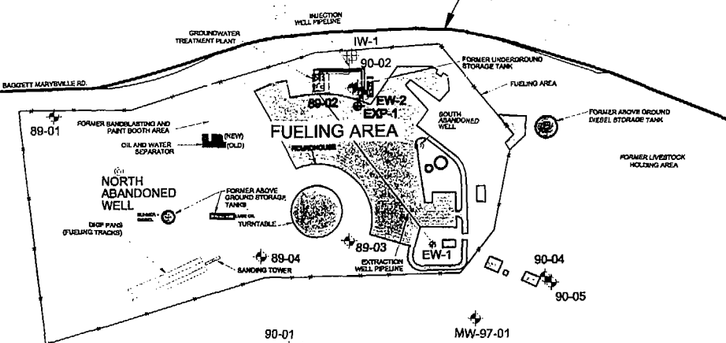
FIGURE 1

CENTER SECTION 20

SO. 1/4 CORNER
SECTION 20

197 OR 245
S.R.&D.C.
TO
T.M. SCHUMACHER
1937
1.43 AC

109 DEEDS 92
L.L. GREEN
TO
W.P.R.C.
1908
45.83 AC



84 DEEDS 77
G.R.D.C. TO W.P.R.C. 1905 9.11 AC

CWS-1

190 OR 38
M.R. LUND (TAX COL)
TO
T.M. SCHUMACHER
1937
(LANDS WEST OF THE ROAD SW 1/4 S20)
57 AC

POND AREA

20 29

SECTION 19 30
CORNER

W 1/4 CORNER
SECTION 20

EXPLANATION

- 90-02 Monitoring Well
- EW-1 Extraction Well
- IW-1 Injection Well
- CWS-1 California Water Service Well
- Fence
- Concrete (Turntable Pit has Concrete Bottom)
- Former Above Ground Bunker Fuel and Lube Oil Storage Tanks
- Inactive Oil/Water Separator
- Former Sandblasting and Paint Booth Areas
- *Drip Pans (Fueling Tracks)*
- Former Underground Storage Tank
- Boundary of Parcels Placed Under Deed Restrictions

WPRC	Western Pacific Railroad Company
SR&DC	Standard Realty & Development Company
GRDC	Gold Run Dredging Company

Site features are depicted in their approximate locations relative to the depicted parcels.

N

0 300
Scale in Feet

SITE MAP

Final Removal Action Report
Western Pacific Railroad Superfund Site
Oroville, California
FIGURE 2

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UnionPacific\Oroville lee May 17, 2001 010511DR.DWG